

What is claimed is:

1. A training apparatus designed to improve the physical readiness level of the low back and pelvic girdle of an individual, said training apparatus comprising:

5 a frame;

a seat supported by said frame;

a pivot mechanism mounted on said frame and providing a pivot point disposed adjacent said seat;

10 an exercise arm extending outward from said pivot mechanism and rotatable about said pivot point; and

a resistance assembly extending outward from said pivot mechanism and rotatable about said pivot point;

15 said exercise arm and said resistance assembly being linked to one another such that said exercise arm and said resistance assembly rotate as a single unit about said pivot point of said pivot mechanism;

said resistance assembly including a first resistance lever arm and a second resistance lever arm;

said first resistance lever arm including a counterweight;

20 said second resistance lever arm including a weight attachment mechanism for attaching a stress weight thereto; and

said second resistance lever arm being angularly offset from said first resistance lever arm by an angle about said pivot point of said pivot mechanism.

2. A training apparatus according to Claim 1, wherein:

said first resistance lever arm additionally includes a weight attachment mechanism for attachment of additional weight thereto; and

5        said counterweight has a weight substantially sufficient to counterbalance an upper torso weight of an individual exerted on said exercise arm when such individual is seated in said seat and exerting such upper torso weight against said exercise arm.

10        3. A training apparatus according to Claim 1, wherein said exercise arm and said resistance assembly are separately and non-integrally formed and wherein said training apparatus additionally comprises:

interlocking means for interlocking said exercise arm with  
15        said resistance assembly such that both of said exercise arm and said resistance assembly rotate as a single unit about said pivot point of said pivot mechanism.

4. A training apparatus according to Claim 3, wherein  
20        said interlocking means includes:

a selective angular locking mechanism for locking said exercise arm with said resistance assembly at a selected one of a plurality of possible angular relationships between said exercise arm and said resistance assembly.

5. A training apparatus according to Claim 4, wherein said selective angular locking mechanism includes:

a radial flange connected to said resistance assembly;

a plurality of apertures provided on said radial flange at  
5 a common radius from said pivot point; and

a plunger mechanism provided on said exercise arm;

said plunger mechanism including a plunger rod for  
selectively engaging one of said plurality of apertures;

whereby said exercise arm and said resistance assembly can  
10 be selectively locked together at one of a plurality of relative  
angular dispositions.

6. A training apparatus according to Claim 4, wherein:

said first resistance lever arm additionally includes a  
15 counterweight attached to said first resistance lever arm at a  
point distal from said pivot point of said pivot mechanism;

said counterweight having a weight substantially sufficient  
to counterbalance an upper torso weight of an individual exerted  
on said training arm when such individual is seated in said  
20 seat; and

said selective angular locking mechanism provides means for  
adjusting the angular inclination of said exercise arm with  
respect to a vertical axis when said first resistance lever is  
in a substantially vertical inclination.

7. A training apparatus according to Claim 1, wherein:  
said pivot mechanism has an axis of rotation; and  
said exercise arm includes a torso contacting portion  
extending substantially parallel to said axis of rotation of  
5 said pivot mechanism;  
said torso contacting portion extending substantially over  
said seat.

8. A training apparatus according to Claim 5, wherein  
10 said training arm additionally includes:  
torso contact adjustment means for selectively adjusting  
the distance of said torso contacting portion of said exercise  
arm from said pivot point of said pivot mechanism.

15 9. A training apparatus according to Claim 1, said  
training apparatus additionally comprising:  
a lumbar positioning device for contacting and positioning  
a lumbar region of an individual utilizing said training  
apparatus, said lumbar positioning device being disposed  
20 substantially immediately adjacent said seat.

10. A training apparatus according to Claim 9, wherein  
said lumbar positioning device includes a lumbar bolster.

11. A training apparatus according to Claim 10, wherein  
said lumbar positioning device additionally includes horizontal  
lumbar positioning adjustment means for selectively adjusting a  
substantially horizontal distance of said lumbar bolster with  
5 respect to said seat.

12. A training apparatus according to Claim 10, wherein  
said lumbar positioning device additionally includes vertical  
lumbar positioning adjustment means for selectively adjusting a  
10 substantially vertical height of said lumbar bolster with  
respect to said seat.

13. A training apparatus according to Claim 1, wherein:  
said exercise arm extends across said pivot point of said  
15 pivot mechanism to form a further counterweight lever disposed  
on a side of said pivot point opposite said exercise arm; and  
said training apparatus additionally includes a further  
counterweight attached to said further counterweight lever on  
said opposite side of said pivot point from said exercise arm.

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14. A training apparatus according to Claim 1, said  
training apparatus additionally comprising:

a thigh engagement device for contacting and restraining an upper surface of a thigh of an individual utilizing said training apparatus.

5        15. A training apparatus according to Claim 14, wherein said thigh engagement surface includes a thigh bolster for engaging and restraining such upper surface of such thigh of such individual utilizing said training apparatus.

10        16. A training apparatus according to Claim 15, wherein said thigh engagement device additionally includes:

thigh engagement positioning means for selectively adjusting at least one of a height of said thigh bolster relative to said seat and a horizontal distance of said thigh  
15    bolster relative to said seat.

17. A training apparatus according to Claim 1, said training apparatus additionally comprising:

a first connection member provided on said frame;

20        a second connection member provided on said resistance assembly; and

at least one elastic resistance element extending between said first and second connection members;

said at least one elastic resistance element exerting a resistance to relative movement between said first and second connection members.

5        18. A training apparatus according to Claim 17, wherein said at least one elastic resistance element includes a plurality of removable elastic resistance elements.

10        19. A training apparatus according to Claim 5, said training apparatus additionally comprising:

a first connection member provided on said frame;

a second connection member provided on said radial flange;

and

15        at least one elastic resistance element extending between said first and second connection members;

said at least one elastic resistance element exerting a resistance to relative movement between said first and second connection members.

20        20. A training apparatus according to Claim 1, wherein said pivot mechanism includes:

a first rotational bearing mounted on said frame and disposed to one side of said seat;

a second rotational bearing mounted on said frame and disposed between said first rotational bearing and said seat;

an axle extending between said first and second rotational bearings and rotatable therein;

5. and wherein:

said resistance assembly is fixedly attached to said axle to move therewith;

said exercise arm includes a tubular sleeve portion surrounding said axle and rotatable with respect thereto;

10 whereby said angular disposition between said training arm and said resistance assembly may be varied.

21. A training apparatus according to Claim 1, said training apparatus additionally comprising:

15 an indicator member connected to said resistance assembly; and

a striated gauge connected to said frame;

whereby movement of said resistance assembly relative to said frame is displayed by movement of said indicator member  
20 relative to said striated gauge.

22. A training apparatus according to Claim 21, wherein said training apparatus additionally includes:

an indicator member connected to said axle; and



a dial gauge connected to said frame and disposed adjacent said pointer member;

whereby movement of said resistance assembly relative to said frame is displayed by movement of said indicator member  
5 relative to said dial gauge.

23. A training apparatus according to Claim 2, wherein:

said additional weight includes at least one of an additional counterweight and an additional stress weight.

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24. A training apparatus designed to improve the physical readiness level of the low back and pelvic girdle of an individual, said training apparatus comprising:

a frame;

15 a seat supported by said frame;

a pivot mechanism mounted on said frame and providing a pivot point disposed adjacent said seat;

an exercise arm extending outward from said pivot mechanism and rotatable about said pivot point; and

20 a resistance assembly extending outward from said pivot mechanism and rotatable about said pivot point;

said exercise arm and said resistance assembly being linked to one another such that said exercise arm and said resistance

assembly rotate as a single unit about said pivot point of said pivot mechanism;

said resistance assembly including at least a first resistance lever arm;

5        said first resistance lever arm including a counterweight; and

said counterweight having a weight substantially sufficient to counterbalance an upper torso weight of an individual exerted on said exercise arm when such individual is seated in said seat  
10 and exerting such upper torso weight against said exercise arm.

25. A training apparatus according to Claim 24, wherein:

said first resistance arm additionally includes a weight attachment mechanism for attachment of additional weight  
15 thereto.

26. A training apparatus according to Claim 24, wherein said exercise arm and said resistance assembly are separately and non-integrally formed and wherein said training apparatus  
20 additionally comprises:

interlocking means for interlocking said exercise arm with said resistance assembly such that both of said exercise arm and said resistance assembly rotate as a single unit about said pivot point of said pivot mechanism.

27. A training apparatus according to Claim 26, wherein said interlocking means includes:

a selective angular locking mechanism for locking said exercise arm with said resistance assembly at a selected one of  
5 a plurality of possible angular relationships between said exercise arm and said resistance assembly.

28. A seating and positioning apparatus for a training apparatus in which an individual performs bending movements  
10 about the hip axis, said seating and positioning apparatus comprising:

a frame;

a seat supported by said frame;

said seat having an upper surface; and

15 a thigh engagement device for contacting and restraining an upper surface of a thigh of an individual utilizing such training apparatus and seated on said seat such that a buttocks portion of such individual is in contact with said upper surface of said seat.

29. A seating and positioning apparatus for a training apparatus according to Claim 28, wherein:

said thigh engagement surface includes a thigh bolster for engaging and restraining such upper surface of such thigh of  
5 such individual utilizing said training apparatus.

30. A seating and positioning apparatus for a training apparatus according to Claim 29, wherein said thigh engagement device additionally includes:

10 thigh engagement positioning means for selectively adjusting at least one of a height of said thigh bolster relative to said seat and a horizontal distance of said thigh bolster relative to said seat.

15 31. A seating and positioning apparatus for a training apparatus according to Claim 28, said seating and positioning apparatus additionally including:

a lumbar positioning device for contacting and positioning a lumbar region of an individual utilizing said training machine  
20 and seated on said seat such that a buttocks portion of such individual is in contact with said upper surface of said seat, said lumbar positioning device being disposed substantially immediately adjacent said seat.

32. A seating and positioning apparatus for a training apparatus according to Claim 31, wherein:

said lumbar positioning device includes a lumbar bolster.

5 33. A seating and positioning apparatus for a training apparatus according to Claim 32, wherein:

said lumbar positioning device additionally includes lumbar positioning adjustment means for selectively adjusting a substantially horizontal distance between said lumbar bolster

10 and said seat.